Clear Roads Phase II TPF-5(353)

A study focuses on advancing winter highway operations nationally through practical, practice-ready research related to materials, equipment, and methods.

WHAT IS THE NEED?

Effective snow and ice removal is essential for keeping roadways open and safe for the traveling public, which can be resource intensive for California Department of Transportation (Caltrans).

This research will focus on advancing winter highway operations nationally through practical, practice-ready research related to materials, equipment, and methods, which answers the research and technology needs that are not currently met. State Departments of Transportation are aggressively pursuing new technologies, practices, tools, and programs to improve winter highway operations and safety while maintaining fiscal responsibility.

WHAT ARE WE DOING?

The research team will evaluate the new tools and practices in both lab and field settings. They will establish industry standards and performance measures, conduct cost-benefit analyses, and develop and evaluate new designs and practices that further improve winter highway safety, and minimize environmental impacts.

Furthermore, the researchers will address both operational and management research needs, investigate the most effective tools and practices for clearing snow and ice; and manage program resources, budgets, and performance measures.

Some tasks include:

- Conducting structured field testing and evaluation across various winter conditions and different highway maintenance organizational structures to assess the practical effectiveness, ease of use, optimum application rates, barriers to use, durability, safety, environmental impact, and cost-effectiveness of innovative materials, equipment, and methods for improved winter maintenance operations.
• Supporting technology transfer by developing and disseminating practical field guides and training curriculum to promote the research results.
• Supporting the exchange of information and ideas among state agencies via peer exchanges, impromptu internal surveys, and collaborative research efforts that provide opportunities for winter maintenance specialists to share experiences related to winter maintenance.
• Conducting quicker turnaround, lower cost synthesis projects to investigate the latest research and practices on pressing winter maintenance topics.

WHAT IS OUR GOAL?

The goal is to advance winter highway operations. The research team will provide extensive support for implementation and technology transfer through the development of user manuals, training modules, peer exchanges, and quick turnaround syntheses of the most effective state practices from around the country.

WHAT IS THE BENEFIT?

This research will provide Caltrans with a direct access to all the studies regarding new equipment and materials that help with the snow clearing operations.

Moreover, it will provide evaluations on the use of innovative materials, equipment, and processes that will promote environmentally sustainable winter maintenance operations. These evaluations will incorporate a cost-benefit analysis to ensure that new technologies, materials, or methods contribute to operational efficiency. Besides, performance measure metrics that match the industry standards for evaluating the new materials and technologies will be included.

WHAT IS THE PROGRESS TO DATE?

The research team completed the following tasks as of January 2019:

• Developed a test bed software to qualify plug and play technology
• Synthesized material application methodologies for winter operations
• Established standards and guidance for using mobile sensor technology to assess winter road conditions
• Initiated weather event reconstruction and analysis tool
• Integrated advanced technologies into winter operations decisions
• Developed standard specifications for plow blades with carbide inserts
• Installed cameras in winter maintenance vehicles

IMAGE

Picture 1: Rotary snow blower removing snow from the roadway.

Picture 2: Liquid brine truck spreading brine along the roadway.